Hypertension, Vol 19, 249-254, Copyright © 1992 by American Heart Association

ARTICLES

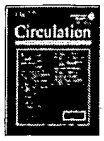
Characterization of a monoclonal antibody specific for human active renin

WM Zuo, RE Pratt, CH Heusser, JP Bews, MM de Gasparo and VJ Dzau
Division of Cardiovascular Medicine, Stanford University School of Medicine, Calif.

We have identified and characterized an anti-human renin monoclonal antibody R1-20-5 that is selective for human active renin. R1-20-5 binds active renin with a dissociation constant (Kd) of 2.5 x 10(-7) M/l and inhibits renin enzymatic activity with an inhibitory constant (IC50) of 1.4 x 10(-8) M/l. R1-20-5 competes with a synthetic renin inhibitor for binding with renin, demonstrating further that it is binding to or close to the active site. This antibody does not bind prorenin in human plasma or recombinant prorenin expressed by L-929 fibroblasts transfected with human renin gene. Furthermore, trypsin activation of prorenin resulted in immunoreactivity of the activated prorenin toward the antibody. In addition, an immunoaffinity column of R1-20-5 coupled to Sepharose retained active renin but had a low affinity for prorenin. A sensitive and rapid solid phase radioimmunoassay for active renin was developed using a "sandwich" technique employing R1-20-5 and a second non-active site-directed monoclonal antibody to human renin. Renin levels in human plasma samples were determined by the standard enzymatic assay, and by the direct radioimmunoassay for active renin, before and after trypsin activation. Trypsin treatment of plasma resulted in parallel increases in both the plasma renin enzymatic activity and in the plasma active renin concentration as measured by the direct radioimmunoassay. Overall, plasma immunoreactive active renin concentration correlated significantly with plasma renin enzymatic activity ($r = 0.96$, p less than 0.001). In summary, the monoclonal antibody R1-20-5 is selective for human active renin and should be a very useful tool for studies of the active enzyme in humans.

This article has been cited by other articles:

J. J. Saris, F. H. M. Derkx, R. J. A. De Bruin, D. H. W. Dekkers, J. M. J. Lamers, P. R. Saxena, M. A. D. H. Schalekamp, and A. H. Jan Danser
High-affinity prorenin binding to cardiac man-6-P/IGF-II receptors precedes proteolytic activation to renin
Am J Physiol Heart Circ Physiol, April 1, 2001; 280(4): H1706 - 1715.
[Abstract] [Full Text]



Circulation ▸HOME

A. H. J. Danser, C. A. M. van Kesteren, W. A. Bax, M. Tavenier, F. H. M. Derkx, P. R. Saxena, and M. A. D. H. Schalekamp

Prorenin, Renin, Angiotensinogen, and Angiotensin-Converting Enzyme in Normal and Failing Human Hearts : Evidence for Renin Binding

Circulation, July 1, 1997; 96(1): 220 - 226.

[Abstract] [Full Text]

HOME HELP FEEDBACK SUBSCRIPTIONS ARCHIVE SEARCH TABLE OF CONTENTS

HYPERTENSION ART, THRO, VASC BIO ALL AHA JOURNALS

CIRCULATION CIRCULATION RESEARCH STROKE

Entrez PubMed
Overview
Help | FAQ
Tutorial
New/Noteworthy
E-Utilities

PubMed Services
Journals Database
MeSH Database
Single Citation Matcher
Batch Citation Matcher
Clinical Queries
LinkOut
My NCBI (Cubby)

Related Resources
Order Documents
NLM Catalog
NLM Gateway
TOXNET
Consumer Health
Clinical Alerts
ClinicalTrials.gov
PubMed Central

1: Hypertension. 1992 Mar;19(3):249-54. Related Articles, Links

Characterization of a monoclonal antibody specific for human active renin.

Zuo WM, Pratt RE, Heusser CH, Bews JP, de Gasparo MM, Dzau VJ.

Division of Cardiovascular Medicine, Stanford University School of Medicine, Calif.

We have identified and characterized an anti-human renin monoclonal antibody R1-20-5 that is selective for human active renin. R1-20-5 binds active renin with a dissociation constant (Kd) of 2.5 x 10(-7) M/l and inhibits renin enzymatic activity with an inhibitory constant (IC50) of 1.4 x 10(-8) M/l. R1-20-5 competes with a synthetic renin inhibitor for binding with renin, demonstrating further that it is binding to or close to the active site. This antibody does not bind prorenin in human plasma or recombinant prorenin expressed by L-929 fibroblasts transfected with human renin gene. Furthermore, trypsin activation of prorenin resulted in immunoreactivity of the activated prorenin toward the antibody. In addition, an immunoaffinity column of R1-20-5 coupled to Sepharose retained active renin but had a low affinity for prorenin. A sensitive and rapid solid phase radioimmunoassay for active renin was developed using a "sandwich" technique employing R1-20-5 and a second non-active site-directed monoclonal antibody to human renin. Renin levels in human plasma samples were determined by the standard enzymatic assay, and by the direct radioimmunoassay for active renin, before and after trypsin activation. Trypsin treatment of plasma resulted in parallel increases in both the plasma renin enzymatic activity and in the plasma active renin concentration as measured by the direct radioimmunoassay. Overall, plasma immunoreactive active renin concentration correlated significantly with plasma renin enzymatic activity (r = 0.96, p less than 0.001). In summary, the monoclonal antibody R1-20-5 is selective for human active renin and should be a very useful tool for studies of the active enzyme in humans.

PMID: 1548051 [PubMed - indexed for MEDLINE]